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State of the art

The invention relates to an apparatus to the receptacle of a fuel order aggregate within a fuel tank after the genus of the principal claim.

To the noise-damped installation of a fuel order aggregate within a fuel tank damping elements and thereby equipped storages are already known which consist of rubber or kraftstoffestem plastic and become in suitable way with the fuel tank anchored. These damping elements hard located in the fuel out and/or. pour strong on, whereby with the time noise bridges could construct themselves. Furthermore the damping elements Größenänderungen experience, whereby attempted became to adjust by a complicated styling of the damping elements these changes.

From the DE-A1 39 27 218 an arrangement for fuel promotion aggregates is in the fuel tank known, become inserted with which the storage damping elements, which are formed as an hollow profile. At a tank flange an aggregate mounting plate is integral formed. This aggregate mounting plate consists of two plate shaped bars, whose distance is so dimensioned that an aggregate-inertial between the bars with sufficient clearance can become disposed. Between them located are the damping elements provided formed as hollow profile, in order to make a noiseless installation possible.

As a result of the complicated shape of these damping elements arise high manufature and assembly costs, which are based in particular on expensive connection techniques for a variety from parts to the attachment of the fuel order aggregate in the fuel tank.

Advantages of the invention

The apparatus according to invention with the characterizing features of the principal claim leads by the integral formation to a significant reduction of the dividing and appraisal costs and thus to the reduction of the manufacturing costs and to a simplification in the assembly. Thus the risks, which arise by expensive connection techniques to the arrangement of the damping elements, can be void.

By the embodiment according to invention of the holding device an integration of support function and a vibration insulation for the fuel order aggregate are simultaneous given.

In the dependent claims advantageous embodiments and developments of the apparatus are indicated.

Drawing

A prefered embodiment of the invention is in the drawing shown and in the subsequent description more near explained.
Show:

Fig. 1 a schematic front view of an holding device according to invention with a fuel order aggregate,

Fig. 2 a schematic side view of the holding device according to invention in accordance with Fig. 1,

Fig. 3 a schematic sectional view of the holding device along the line III III in Fig. 1 with a tool interface level,

Fig. 4 a schematic partial section of an alternative holder assembly to the fuse of the fuel order aggregate,

Fig. 5 a schematic front view of an alternative embodiment of an holding device to Fig. 1,

Fig. 6 a schematic side view of the alternative embodiment in Fig. 5 and

Fig. 7 a schematic front view of an other alternative embodiment of an holding device to Fig. 1.

Description of the embodiment

Into the Fig. 1 to 3 is an holding device 11 to the receptacle of a fuel order aggregate 12 and arrangement in a fuel tank shown, which is formed as integral squirted plastic part. This holding device 11 can from a kraftstoffesten plastic, as for example POM or a such. manufactured its. The fuel order aggregate 12 covers a feed pump and a drive for the feed pump, which are in a common housing disposed.

The holding device 11 exhibits a tank flange 13, with which the holding device is anordenbar 11 in the fuel tank in receptacles formed for it in the fuel tank. The tank flange 13 exhibits a radial outward standing circumferential ring portion 17 and an essentially rectangular collar 18 formed to the ring portion 17, over which the tank flange is anordenbar 13 in the fuel tank. Alternative to the ring portion 17 can do at least or several uniform mounting straps or such distributed over the periphery. provided its. The tank flange 13 exhibits an electrical connecting element 19 to the power supply and drive of the fuel order aggregate 12. Furthermore an hydraulic is connecting element 21 for example as ports formed at the tank flange 13, at which a gasoline supply line, which leads to the internal combustion engine, is connectable. Userally-specific an other for example hydraulic connecting element formed as ports can be 22 provided at the tank flange 13, at which a

return line is connectable. This hydraulic connecting element 22 is to be planned if the holding device is 11 for an engine with rücklaufbehaltetem injection system provided.

The fuel order aggregate 12 an ambient receptacle 14 stands over first and second uncoupling elements 24, 27 with the tank flange 13 in connection and is axial to this spaced disposed. The axial Beabstandung made over first uncoupling elements 24, which are formed as struts. Favourable-prove three struts are provided, which already make a first vibration insulation possible. At the tank flange 13 opposite end of the struts 24 an outside ring portion is 26 formed, which surrounds the receptacle 14. The outside ring portion 26 is in the region of the strut 24 min min interrupted, in order to be able to release the hook from form 29 by the wall 34.

On the diameter of the outside ring portion 26 disposed struts 24 strip shaped formed is and can an outer the circle diameter corresponding curvature exhibit. The outside ring portion 26 is 13 spaced axial to the tank flange by three struts 24, which are in an angle of 90 DEG spaced to each other, whereby first and a third strut include an angle of 180 DEG and in a tool interface level lie, so that a simple and favourable formation of an injection mold is possible, as other down still performed becomes. With the use of the holding device 11 for a system with return to the reservoir a strut 24 min can be tubular formed and as return pipe and/or. Return line for the fuel formed recycled of the engine its. For an use of the holding device 11 in a system without return the strut 24 min can be likewise strip shaped like the struts 24 min min and 24 min min formed.

Between the outside ring portion 26 and the receptacle 14 second uncoupling elements are 27 provided, which are as radial to longitudinal axis of the receptacle disposed bars formed. The bars 27 exhibit one in S-förmigen course, so that the torques with on and shutdown of the fuel order aggregate by an engine controller, generated by the fuel order aggregate 12, and/or. by engine management compensated to become to be able, as the S-förmigen bars, which are in radial direction of movement of the receptacle seen, resilient formed, can take up and absorb these torques. The bars 27 are seen rectangular formed for it in the cross section, whereby in axial direction to longitudinal axis of the receptacle is extending length a multiple one opposite the width of the bars seen in radial it direction.

The receptacle 14 is tubing or capsule-shaped or such. formed and can itself favourable-proves over 2/3 to the length of the fuel order aggregate 12 to extend and a safe receptacle for this to form. At its end pointing to the tank flange 13 a projection pointing inward is 28 formed and forms thereby an axial stop for the fuel order aggregate 12. At the stop 28 opposite end of the receptacle 14 a rest connection is 29 provided. This is 34 formed, itself in the direction of the bottom end of the fuel order aggregate 12 extended and at its free end a detent element 36, to the fuse of the fuel order aggregate 12 in the receptacle 14 as axial itself extending tab, as for example a rest hook, - cam or such, formed is. When using the fuel order aggregate 12 into the receptacle 14 the detent element 36 can evade in radial direction and engage below with a bottom edge of an intake 32a disposed at the fuel promotion aggregate, as soon as the fuel order aggregate 12 against the axial stop in the receptacle 14 rests.

Alternative ones for this can, as in Fig. 4 shown, over the periphery of the receptacle 14 evenly distributed several tabs 34 with detent elements 36 formed its.

In Fig. 2a is an alternative embodiment of the rest connection 29 to Fig. 2 shown. The receptacle 14 exhibits a window 41 in the region of the intake 32a in the tab 34, into which a detent element 36 of the filter member 32 engages. When putting the filter member 32 on the tab 34 can evade outward. The detent element 36 can be postponed due to its introduce-oblique light and be come in the window 41 to the request and created a safe connection.

On the intake 32a of the fuel order aggregate 12 a filter 32 is attached, which is with the incorporation of the holding device 11 close of the fuel tank soil disposed, as in Fig. 4 shown is. Simultaneous one knows a fuse of the filter 32 to the fuel order aggregate 12 and/or. the receptacle 14 provided become, which is 33 formed as filter guard ring.

A filter upper section 50 of the filter 32 exhibits upward standing brackets 51, at least partly between the tabs 34 of the rest connection 29 seizes and to simultaneous with a portion at its free end, formed between the brackets 51, lies close and filter 32 to the rest connection 29 beabstanden.

In the mounted state the filter guard ring 33 surrounds the tabs 34 of the rest connection 29 with light clearance and rests to bottom pressing against the brackets 51 of the filter upper section 50.

Thus on the one hand the layer of the filter guard ring is 33 fixed, still by shoulders on the filter upper section the 50 is prefixed and on the other hand is a flared one of the tabs 34 prevented, so that a loosening of the fuel order aggregate can become 12 from the receptacle 14 avoided.

To the fabrication of the integral squirted holding device 11 is with this embodiment a fourth-hasty injection mold provided. A first tool part exhibits a first parting plane 41, whose course paint-lines shown into the tank flange 13 and the strut 24 min is. This first tool part becomes upward opened in axial direction of the holding device 11.

For the formation of the struts 24 and the electrical and hydraulic connecting elements 19, 21 below the first parting plane 41 are a second and third tool part provided, its in axial direction located parting plane 42 by one in Fig. 3 represented shading shown is. The lateral upper and lower limitations of the second and third tool part seen in axial direction to take place on the one hand via the first parting plane 41 of the first tool part and via a third parting plane 43 of the fourth tool part. This fourth tool part forms the outside ring portion 26, the bars 27 and the receptacle 14 and the rest connection 29. Releasing the holding device 11 from form this fourth tool part becomes downward opened, thus in opposite direction the first tool part, which becomes opened in axial direction upward. The rest connection 29 with the tab 34 becomes formed by the second tool part and the fourth tool part, whereby the interior region of the tab becomes 34 formed by the fourth tool part, whereby only with the embodiment corresponding Fig. 4 the tab 34 with obligation releasing formed becomes.

So that a simple embodiment of the second and third tool part is possible, the struts 24 min and 24 min min lie in the second parting plane 42 and the strut 24 min min in an angle around 90 DEG offset to the first or third strut 24 min, 24 min min min. Furthermore the stop becomes 28 by the fourth tool part formed at the receptacle 14.

In Fig. 5 and 6 is an alternative embodiment of an holding device 11 to the receptacle of the fuel order aggregate 12 shown. This embodiment yields in its embodiment of the second uncoupling elements 27 and the formation of the

receptacle 14 of the holding device 11 in accordance with Fig. 1 to Fig. 3 off. The remaining components of the holding device 11 in Fig. 5 and Fig. 6 is identically constructed with those in Fig. 1 to Fig. 3.

The first and second uncoupling elements 24, 27 ignore more immediate into one another, D. h. that to the struts 24 immediate u-shaped are formed bars 27 formed, the receptacle 14 13 beabstanden axial to the tank flange. The u-shaped bars are 27 at the struts 24 min and 24 min min disposed located in the parting plane 42 to the simpler embodiment of the second and third tool part. The strut 24 min is immediate to the receptacle 14 formed. The u-shaped formed bar 27 are in such a manner disposed with the fact that the prolonged parallel to each other disposed legs extend in axial direction to longitudinal axis the receptacle 14. Thus the arising torques and oscillations can do received and opposite the tank flange 13 damped and/or. insulated become.

The receptacle 14 is 37 formed from each other opposite and to each other half shells offset in axial direction, which exhibit a collar 38 pointing inward at their bottom end. The fuel order aggregate 12 inserted from above into the receptacle 14 can rest against the lower collar 38 and is thus in its position to the holding device 11 fixed. The collar 38 opposite again a rest connection 29 with a tab 34 can be and a detent element 36 formed, which secure the fuel order aggregate 12 in the receptacle 14.

The embodiment of a such holding device 11 has the advantage that with the fabrication as Spritzgussteil a three-part tool is sufficient, in order to manufacture this holding device 11 as integral Spritzgussteil. A first parting plane located in the tank flange 13 is 41 (paint-lined) provided, whereby first part of the tool, in axial direction of the holding device 11 seen, becomes upward removed. The uncoupling elements 24, 27 and the receptacle 14 become essentially formed by a second and third tool, which exhibit a second parting plane 42, like essentially also from Fig. 3 comes out.

In Fig. 7 is an other alternative embodiment of an holding device 11 in accordance with Fig. 1 shown. The vibration insulation this holding device 11 made only over first uncoupling elements 24, which are immediate to the receptacle 14 formed. Thus a simple embodiment can opposite in Fig. 5 and Fig. 6 described embodiment of the holding device 11 given its. Simultaneous ones can become tooling expenses lowered here, since the costs for the formation of the bars 27 can be void as second uncoupling elements.